

# Walden University

COLLEGE OF EDUCATION

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Walden University  
2010

ABSTRACT

Beliefs and Practices About Implementing Technology in Physical Education

by

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M.S., West Virginia University, 2005

B.S., The Ohio State University, 1991

Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy  
College of Education

Walden University  
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## ABSTRACT

There is little research in the field of physical education on whether technology can help decrease the level of childhood obesity in physical education classes or on why physical educators choose to use or not use technology in their programs. The purpose of this phenomenological study was to examine physical educators' beliefs and practices regarding and experiences with the use of technology in their classes. Maslow's theory of human motivation provided the study's framework. Data sources included interviews and protocol writings from 11 urban K-12 physical educators in one midwestern U.S. state, and inductive data analysis included using pre-identified categories to develop themes and patterns. Data revealed physical educators most frequently used pedometers, heart rate monitors, and digital cameras as technologies in their classes. Further, data indicated physical educators believed those technologies energized and motivated their students, helped decrease obesity in their classes, and helped create more physically educated individuals. Data also showed that those various technologies were used throughout the participants' classes despite what was sometimes a lack of support from building administrators and district leadership. Finally, results indicated there were a number of barriers to educators' optimal integration of technology in classroom activities. This study contributes to positive social change by providing information administrators can use to increase student physical education performance which can, in turn, result in lower health care costs, lower obesity rates, and improved academic performance.

PREVIEW

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DEDICATION

To my wife Barb, and sons Isaiah and Sam for their continued support through this life changing process.

PREVIEW

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PREVIEW

CHAPTER 1:  
INTRODUCTION TO THE STUDY

Introduction

According to the Centers for Disease Control and Prevention (2008), data from the most recent National Health and Nutrition Examination Survey indicated that the prevalence of obesity continues to be a health risk factor for adults, children, and adolescents “Based on the study, in the combined years of 2003—2006, 16.3% of children and adolescents aged 2–19 years were obese, at or above the 95th percentile of the 2000 BMI-for-age growth charts” (p. 1). This rate of obesity raises concerns because of its implications for the health of American children. Obesity increases the risk of many different forms of health conditions and diseases including the following: hypertension, osteoarthritis (a degeneration of cartilage and its underlying bone within a joint), high total cholesterol or high levels of triglycerides, type 2 diabetes, coronary heart disease, sleep apnea and respiratory problems, some cancers, stroke, and gallbladder disease (Centers for Disease Control and Prevention).

As a result of the increase in childhood obesity, the Centers for Disease Control and Prevention (2008) recommended that children between the ages of 5-12 should accumulate more than 60 minutes of moderate to vigorous physical activity each day. Results of a survey across the United States by the Institute of Educational Sciences (2006) indicated that children in the United States receive an average of 2.4 to 2.6 days per week of physical education. This is equal to an average of 91 minutes of physical education per week. Combining recess with physical education increases the amount of

participation of physical activity to 208 to 222 minutes per week. In addition, when asked what type of physical activity elementary schools used, 64% of the schools stated that they use nontraditional physical education activities such as dance or kick-boxing to make physical education more enjoyable and rewarding for the students. According to the survey, at least 50% of the schools use three broad types of physical activities or programs to encourage activity for their elementary students. Fifty-eight percent of the schools use organized physical activity outside of physical education, 55% use the President's Challenge Physical Activity and Fitness Award, and 51% stated that they emphasize a school sponsored before or after school activities that focuses on physical activity.

According to Graber, Woods, and Castelli (2007), children have had many opportunities to participate in physical activity by playing with friends in their backyards and walking to school. Even though technological innovations have resulted in many conveniences, these same advances are responsible for lower levels of physical activity in children. For example, children are more willing to engage in playing video games or watching television than they are in playing in the backyard. Fiorentino and Castelli (2005) stated that physical educators struggle with challenges that occur when assessing student performance, providing feedback and motor skills, and creating opportunities for all students to engage in game-play on a basis. According to Fiorentino and Castelli, "integration of technology in the gymnasium can address some of these challenges by improving teacher efficiency and increasing student motivation" (p. 1). National and state guidelines require teachers and students to master basic technology skills (Fiorentino and

Castelli). As an example, Adelphi University and the University of Urbana-Champaign require teachers to apply their technology skills directly to their physical education classes to increase their student's participation levels (Fiorentino and Castelli). According to the authors, student choice and technology integration have both been shown to motivate students. Students are more eager to assume responsibility for their learning if they have a voice on how they are taught. In addition, problem-solving skills have been showed to be enhanced with the integration of technology into their instructions.

Although it has not been determined that physical educators will successfully have an impact on the nation's health crisis, it is possible that if teachers use all of the tools at their disposal they can increase the impact of how physical education is taught in K-12 schools in the United States and decrease the obesity rate among children. Graber, et al. (2007) explained that more physical education is not always necessarily better, because quality physical education will almost always be favored over quantity. Martin, McCaughtry, Kulinna, Cothran, and Faust (2008) agreed that it is important that physical educators help children become more active and healthier, because many children and adolescents are physically inactive and are becoming even less active as they age. Physical activity through school physical education is one way that physical educators can help children increase their physical activity and fitness. Martin et al. stated that "the delivery of a physical education curriculum designed to promote physical activity can be enhanced through the incorporation of technology" (p. 69).

Technology can potentially help teachers enhance and extend instructions in terms to support self-regulating learning and to individualize instruction. Ince, Goodway,

Ward, and Lee (2006) stated that technology can be perceived as being both helpful and a source of frustration within educational settings. However, educators attempting to find solutions to the challenge of using technology in their classes can become frustrated. As a result of this, researchers agreed that improved teacher training at the preservice and in-service levels is the key to improve motivation and increase the use of technology.

Technology can be used by physical educators in their classes. Mohnsen (2004) defined this technology as computers, wireless networks, DVDs, computer fitness reports, instructional software, the Internet, heart monitors, video analysis of performance, electronic portfolios, and pedometers. Roblyer (2006) stated that “educational technology offers teachers valuable resources for informing and empowering students to make the right health choices” (p. 394). In addition, the most effective technologies are hands-on, cooperative activities, and activities that include problem solving and peer instruction. Some examples of technology resources and integration strategies that teachers use to help students lead longer and healthier lives are devices that are designed to improve and analyze fitness levels (Roblyer). Such devices are treadmills, stair steppers, stationary bikes, rowers, electronic blood pressure devices (to monitor blood pressure), body composition analyzers (to determine the percent of body fat), pedometers (to monitor steps one takes), accelerometers (to count calories), spirometers (to measure lung volume), and heart rate monitor (to measure heart rate) (Roblyer). Other forms of technology strategies include video analysis to develop and improve motor skill performance, internet based programming to shape students’ beliefs



and interactions related to physical activity, and software analysis programs to help teachers and students monitor and improve health-related fitness programs (Roblyer).

This research will contribute to the body of knowledge and expand on the integration of technology into physical education, and will have implications for social change. Physical educators are in a position to integrate technology in their classes by making their programs more effective and to make student learning more practical in today's educational environment. Technology can help teachers create more developmentally appropriate lessons and promote better skill and fitness development and help fight childhood obesity. Social change can occur through the results of this research study by providing the physical education profession with knowledge and awareness on how technology can enhance a physical educators' effectiveness in implementing technology in their classes.

#### Problem Statement

The problem addressed with this qualitative study was to understand why physical educators select to use technology within their physical education programs. It is currently unknown what the beliefs and practices of urban K-12 physical educators are concerning implementing technology in their physical education programs, and if implementing this technology helps physical educators create a physically educated person as assessed by the National Association for Sport and Physical Education (NASPE) standards. Currently there is little research on the beliefs and practices of physical educators with implementing technology in K-12 programs. Studying this topic is important due to the increased level of childhood obesity of K-12 youths in the United

States, which indicates that physical educators should be using all tools at their disposal to help fight this disease. This study informed this problem by understanding why physical educators choose to use different types of technology within their K-12 programs. Mohnsen (2005) stated that over the past 20 years educators have seen an increase in the use of still and video cameras, heart rate monitors, pedometers, instructional software, the Internet, and electronic portfolios as instructional resources in the use of technology in physical education. In addition, Mohnsen believed that the next big technology for physical education could include virtual reality simulations technology.

#### Background of the Problem Statement

It is important that physical educators help children become more active and healthier, because many children and adolescents are physically inactive and are becoming even less active as they age. Physical activity through school physical education is one way that physical educators can help children increase their physical activity and fitness (Martin et al., 2008). This can further be enhanced through the implementation of technology in physical education classes (Martin et al.). Today's children are all less physically active because they spend more time watching television and playing computer games instead of outside in physical play. This nationwide trend affects both the motor development and health of the children in the United States (Martin et al.). Although technology may be responsible for some of this changed behavior, it also can be a motivator to change this behavior with physically engaged computer games such as "downhill skier, Dance Dance Revolution, and golf games"

(Roblyer, 2006, p. 394). However, this should not be a substitute for mandatory physical education during the school day. Roblyer (2006) believed that “technology resources improve communications among and the productivity of students and teachers; allow more hands-on, visual learning experiences; help motivate students to spend more time on activities; and serve as a platform for students’ products” (p. 395). With the use of technology, physical educators can help decrease childhood obesity through the use of different forms of technology in physical education classes.

There is little evidence of research that has been conducted on whether the implementation of technology creates a physically educated person, as defined by the NASPE. However, similar studies that did not specifically involve technology have been conducted recently. Graber and Locke (2007) conducted a large and comprehensive study “over a four-year period to assess the degree to which children were making progress toward achieving motor competence (Standard 1), regular participation in physical activity (Standard 3), and a health-enhancing level of physical fitness(Standard 4)” (p. 416). The results of the study indicated that when children are taught a curriculum that follows the NASPE standards, they have higher amounts of physical activity compared with students that did not receive a curriculum that follow the standards. As a result, there is further evidence to support that those students who are considered the most active were also characterized as the most highly skilled and had exposure to greater amounts of physical education throughout the school year, “Therefore, it behooves all professionals-ranging from physical educators and physical activity instructors to teacher educators-to demonstrate that physical education does, make a difference” (p. 422).

Graber and Locke (2007) suggested that good programs and pedagogy alone cannot prepare students to achieve the NASPE standards. These results indicate that the development of children's motor competence and physical fitness is affected by the influence of the entire environment, "it takes a whole community to raise a child into healthy adulthood" (p. 421).

#### Purpose Statement

There is little data that specifically addresses urban K-12 physical educators' beliefs and practices with implementing technology and if implementing this technology helps to create a physically educated person. The purpose of this study was to examine urban K-12 physical educators' beliefs and practices regarding implementing technology in their physical education classes, and if implementing this technology helps physical educators to create a physically educated person according to the NASPE standards.

#### Nature of the Study

Merriam (2002) explained that qualitative research draws from a long tradition in anthropology, sociology, and clinical psychology, and in the last 20 years have achieved recognition in the social sciences and other helping professions. The key to understand qualitative research is with the meaning that is socially constructed by individuals and their relationships with the world around them. Qualitative researchers are interested in how individuals experience and interact within their social world.

A qualitative approach in the phenomenological tradition was used to conduct this study. Merriam (2002) explained that a phenomenological tradition focuses on the essence or structure of an experience. There are two approaches to phenomenology,

hermeneutic and psychological phenomenology. Hermeneutical phenomenology is research toward lived experiences and interpreting life; psychological phenomenology is on a description of the participant's experiences and not as much on the interpretations of the researchers.

The method of inquiry that was selected for this research study was the phenomenology design. This method of inquiry enabled the researcher to understand, describe, and interpret the phenomenon by using a hermeneutic phenomenology design. This was accomplished by examining the phenomenon through several physical educators' personal experiences as it is related to implementing technology in their classes. A homogeneous sample selection was used for 11 physical education teachers involved in the study. The primary data-collection method was accomplished through interviews and asking individuals to write their experiences down in protocol writings. An in-depth interview was conducted at the beginning of the study and a follow-up interview was conducted after the analysis of the first interview that revealed additional questions about the phenomenon. Both interviews were conducted from April through May 2009. Prior to the first interview, participants were asked to write a one-page document about their experiences as it relates to implementing technology in physical education. A qualitative data analysis and interpretation plan was used for this study.

#### Research Questions

1. How and to what extent do physical educators use technology in their classes?
2. What is the most commonly used technology used in physical education classes?

3. Why do K-12 physical educators choose to use technology in their classes?
4. What inhibits K-12 physical educators from selecting to use technology in their classes?
5. How does implementing technology affect students' activity levels within K-12 physical education classes?
6. How does implementing technology affect physical educators' efforts with creating a physically educated person as defined by the NASPE standards?

### Conceptual Framework

To conduct this study, a qualitative approach in the phenomenological tradition was employed. The phenomenological tradition was selected because it described the meaning for several individuals and their lived experiences of a concept or a phenomenon. There are two approaches to phenomenology, hermeneutic and psychological phenomenology (Hatch, 2002). Hermeneutical phenomenology is research toward lived experiences and interpreting life; researchers “seek to reveal the essence of human experience by asking, what is the nature of this phenomenon” (Hatch, 2002, p. 30). Whereas, psychological phenomenology is focused on a description of the experiences of the participants, and less on the interpretations of the researchers that hermeneutic phenomenology is focused on.

The researcher was seeking to understand, describe, and interpret the phenomenon by using a hermeneutic phenomenology design. This was accomplished by examining the phenomenon through several physical educators' common experiences as it is related to implementing technology in their classes.

## Definition of Terms

*Childhood Overweight:* Overweight is defined as a BMI at or above the 95<sup>th</sup> percentile for children of the same age and sex, (Centers for Disease Control and Prevention, 2008).

*Body mass index (BMI):* A practical measure used to determine overweight of an individual. BMI is a measure of weight in relation to height that is used to determine weight status, (Centers for Disease Control and Prevention, 2008).

*Hermeneutical phenomenology:* Research toward lived experiences and interpreting life; researchers

write a description of the phenomenon, maintaining a strong relation to the topic of inquiry and balancing the parts of the writing to the whole. Phenomenology is not only a description, but it is also seen as an interpretive process in which the researcher makes an interpretation. (Creswell, 2007, p. 59)

*Moderate physical activity:* Physical activity that can be performed for relatively long periods of time without fatigue, (Centers for Disease Control and Prevention, 2008).

*National Association for Sport and Physical Education (NASPE) Standards:* A document that presents content standards for what a student should know and be able to do as a result of a quality physical education program, (National Association for Sport and Physical Education, 2004).

*Obesity:* Obesity is defined as a body mass index (BMI) of 30 or above. BMI is calculated using height and weight. For example, a 5-foot, 9-inch adult who weighs 203 pounds would have a BMI of 30, thus putting this person into the obese category, (American Obesity Association, 2008).

*Physical activity:* Physical activity is any bodily movement produced by skeletal muscles that result in an expenditure of energy, (Centers for Disease Control and Prevention, 2008).

*Physical fitness:* Physical fitness is a set of attributes a person has in regards to a person's ability to perform physical activities that require aerobic fitness, endurance, strength, or flexibility and is determined by a combination of regular activity and genetically inherited ability, (Centers for Disease Control and Prevention, 2008).

*Protocol writings:* Asking individuals to write their experiences down that relates to the phenomena under investigation, (Hatch, 2002).

*Vigorous physical activity:* Physical activity that expends more energy or is performed at a higher intensity than brisk walking, (Centers for Disease Control and Prevention, 2008).

#### Assumptions

1. Participants of the study were honest when participating in the survey and answering interview questions.
2. All participants participated in the initial interview, and protocol writings, and second interview if necessary.
3. Participants did not disclose any interview conversations with other individuals.
4. Participants knew and answered the questions that were asked during the interview.